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Mathematical Learning Strategy of Fractional form by using Learning Model of Gagne and Human Figure Line Media

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Abstract

The purpose of this study is to help students develop a conceptual understanding of the amount represented by fractions. This lesson is given after the students know how to simplify and equate the fractions with the model of learning Gagne through the medium of human numbers line that is the number of date and month of birth of the student itself as a fractional material. This research teachers can make mathematics learning strategy in student life so interesting and not boring. Seen from the results of students work shows that the fractional forms by using the model of the human numbers line developed in practical and simple. Mastery of the results of student training cooperatively reached the criteria of 86.25%, and the quality of the problem quite well seen from the results of student work.

Keywords: fractional form; media; model; strategy.

1. Introduction

Said learning we already know as a process of student learning, a series of activities designed to enable the learning process in students.

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If we symbiosis both understanding the strategy and learning then there will be understanding that the learning strategy is the use or application of a plan designed to enable the learning process in students in achieving the learning pbjectives. In teaching, we always know the goal we must achieve in teaching a subject. For that, we formulate specific instructional goals, based on the Bloom Taxonomy of behavioural goals [1] that encompass three domains: cognitive, affective, and psychomotoric.

According to [6], the basic concepts of learning strategies include: defining the specification and quality of student behavior change, determining the choice of dealing with approaches to learning problems, choosing procedures, methods and teaching-learning techniques, norms and success criteria of teaching and learning activities. Learning strategies can be interpreted as planning that contains about a series of activities designed to achieve certain objectives. A teaching strategy applied by the teacher will depend on the approach used while how to execute the strategy the teacher's learning method can determine the techniques that he deems relevant to the method and the use of the technique every teacher has tactics that may differ from teacher to one another. Learning strategy is also defined as the pattern of learning activities selested and used teachers contextually in accordance with the characteristics of students school conditions, the environment and the specific objectives of learning formulated. It is necessary to link the learning strategy with the purpose of learning in order to obtain the steps of effective and efficient learning activities.

From the observations seen in the Mathematics learning in the VII Grade of State of MTS 2 Medan field is still low student interest in Mathematics subject and can be known at the time students follow the learning. After completing the material delivery to the students, the teacher assigns the task to the students to work on the problems contained in their book. Math lessons in schools are often considered difficult and tedious for students, can be seen from the value of the evaluation results of mathematics subjects are still low.

The development of science and technology has an impact on all in life. In addition to rapid development, changes also occur quickly. Therefore it is necessary to acquire, process and utilize such science and technology professionally. This capability requires systematic, logical and critical thinking that can be developed through mathematical learning.

Mathematics is one component of a series of subjects that have an important role in education. Mathematics is one field of study that supports the development of science and technology. But at this time there are still many students who feel mathematics as a difficult subject, not fun, even scary. [9] mathematics is a subject tht students consider to be a fairly difficult lesson. This fraction lesson is a bit difficult so teachers should be good at minimizing the difficulty felt by each student so that it takes a learning strategy, so that the learning process of mathematics will be handled wel and the child feel calm facing the math lesson. The mathematics learning strategy here uses the human birth date media itself as a fractional material.

According to the theory of Gagne, it is formulated that learning is a process of changing the behaviour of an organism as a result of experience. In Gagne's theory there are eight types of learning:

1. Learning signals, according to the theory of conditioning according to Pavlov, which gives a reaction to

an incentive, the response arises after obtaining stimuli.

2. Learning stimulus-response, ability gained after doing repetitive exercise. The response is specific, unusual, manageable and controlled.
3. Learn to form a series of behaviour (motor chainning), actions or movements that one associated with other actions.
4. Learn verbal associations, a stimulus that is given a verbal reaction.
5. Learning discrimination, giving different responses to similar or similar stimuli.
6. Learn concepts, objects are placed in certain groups or classify.
7. Learn the rules, by connecting some concepts to get a principle.
8. Learn to solve the problem, the rules obtained are used to solve the problem.

According to [10] learning model Gagne seen from the learning outcomes are cognitive, affective and psychomotor whch is the ability. In terms of the expected outcomes of a teaching or intruction, it needs to be distinguished because it enables a variety of human appearances and also because the conditions for acquiring these abilities differ from those that help students in math lessons in the form of fractions, a teacher provide innovation to students so that math lessons are not difficult.

Net [4], media selection is determined according to agreed student response, so that its function is not only as stimulus of student learning stimulus only. For example, in a fractional lesson using the human numerical line model, here it displays intellectual (cognitive), how to solve the problem, psychomotorically skillfullly or vice versa whereas attitude, how attitude in the face of a slow friend understand the problem.

According to [2], the fraction is defined as part of something infact. The fraction number is a number expressed in terms of comparison. We know if a fraction of a/b means a:b (read a to b or a per b). Furthermore () in general the fraction of a/b is read a per b with a and b is an integer and b $\neq$ to 0. Fractionn a/b, a is called a numerator with a using the month of birth whereas b uses the dateof birth as a presenter, used as a learning medium. So the fractional form in general a/b with a is called the numerator, b is called denominator and b=0 if a<b a/b are called pure fractions. If a>b, a/b are called impure fractions. According to the fractional type there are regular fractions such as 8/5, 1/3 mixed fractions decimal fractions 1.6.

According to [11] the prime presentation of fractional values in the form of drawings on the blackboard is still felt abstractly for most students, especially the way of reading and writing the symbol of fractions. Students are mistaken in summing up the results of the fractional comparisons. Most students have not been able to change the problem of fractional comparison to mathematical comparison.

Students have not used concrete and appropriate media in fractional learning. The purpose of the study was to describe the use, barrier, and solution of human birth date media in enhancing the understanding of ordinary fractions. Like this picture.

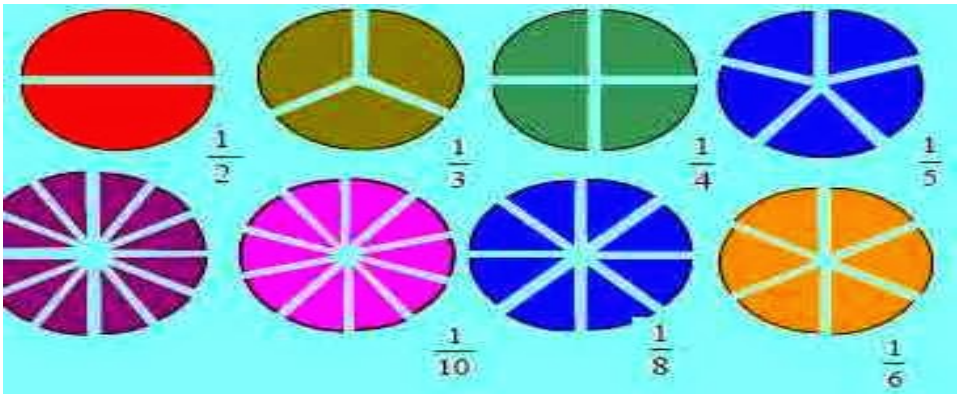


Figure 1: regular Shards

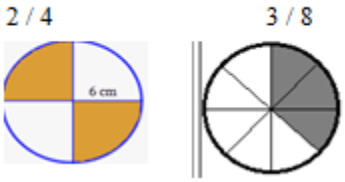


Figure 2: mixed fractions

2 = month 4 = birth date

2 / 4 , 3 / 8 is a commonly fractions

Turn to the decimal fraction

2 / 4 = 0.5 3 / 8 = 0.375

Turn the decimal fractions into a regular fraction

In changing the decimal fractions to a regular fraction we should pay attention to what the numbers are behind the comma of the decimal fractions. REMEMBER!! If there is 1 digit behind the comma means the denominator 10, if 2 numbers behind 100.

0.2 = 2/10 is simplified to 1/5

0.50 = 50/100 is simplified to 1/2

According [14], media contribution in learning are:

1. Learning achievement can be more standardized

2. Learning can be interesting
3. The delivery time of learning can be shortened
4. The quality of learning can be improved
5. The learning process can take place whenever and wherever required
6. Positive attitude of students there are learning materials and learning process can be improved
7. Teacher's role changes in a positive direction

Some of the educational media often used in learning such as print media, electronics, models and maps . This is all used or implemented from the willingness, ability of teachers and supported by supporting faciliies for the creation of learning in accordance with the condition of the child and the nature of the material being taught.

The mathematics learning model is the conceptual framework of mathematics learning. Learning mathematics in question is learners learn mathematic and teachers to transform mathematical knowledge and facilitate learning activities of mathematics can include learning strategies approach, methods, and learning techniques. In learning mathematics core is students or learners expected their activities during learning process, math will be more meaningful and more perfect [5].

According to [6], seen from the basic concept of learning strategy applying the specification and the quality of learning behavior change, determining the choice regarding approach to learning problem, choosing procedure, teaching learning method and method, norm and criteria of success of teaching and learning activity. Strategy can be interpreted as the outline of the bow to act in order to achieve a predetermined goal. Associated with learning to teach strategies can be interpreted as general, teacher activities, students in the realization of teaching and learning activities to achieve the goals that have been determined.

Teaching that requires students on various issues will educate students to always ask so that problems can be developed both in analyzing and in solving it. This condition will also lead to the emergence of a new problem that is not only sourced from the teacher but also from the students. Effective teaching will be able to provoke the atmosphere of discussion among students so that the conditions will be able to create the ability of cooperation for students in solving multi-direction communication that is the interaction between students, with teachers, students with other learning resources both in groups and individuals.

According to [7] learning mathematics in the sense of solving mathematical problems involves reasoning, attitude, emotion, which is positive and the drive to solve problems rationally and wisely. So that children not only become a reference for teachers in designing learning, but must be used as a condition of learning.

Although mathematics is considered to have a high degree of difficulty, yet everyone should learn it because it is a means to solve everyday problems. Such problem solving involves the use of information, the use of knowledge about the shape and size, the use of knowledge about counting and most important is the ability to see and use relationships.

According to the next [8] create a quality learning process, teachers often find difficulty in providing learning materials. Especially for math teachers in the implementation of scholl learning still and indicate the

shortcomings and limitations. Especially in providing a concrete representation of the material presented, so that it directly affects the low and uneven quality of outcomes achieved by the students. Such a condition will occur as long as the mathematics teacher still considers that he is a learning resource for students and ignores the role of instructional media. We must admit that the right media, will make a positive contribution in a learning process that uses the right media, will provide optimal results for students' understanding of the material being studied.

According to [9], the media as a tool in teaching and learning is a reality that can not be denied. Because it is the teacher who wants it to assist the task of teachers in delivering messages from the lesson material given by the teacher to the children. Teachers are aware that without the aid of the media, the subject matter is difficult to digest and be understood by every student, especially the complicated or complex.

Understanding of media in teaching and learning process tends to be interpreted as graphic, photographic, or electronic tools to capture, process and rearrange visual and verbal information. Another limitation of AECT (association of education and communication technology, 1977) provides restrictions on media as all forms and channels used to convey messages or information that intend instructional or containing the purpose of teaching then the media is called the media of teaching.

The line of human numbers as a fun mathematics learning media that is the date and month of human birth. Students will usually mention the pieces that have the same numerator and denominator. This denomination comes from the date of birth which month and date are the same, as October 10th, 10/10 or 5/5 has a value of one.

According to [10] Gagne learning model in which learning outcomes are influenced by five skills, namely intellectual skills, cognitive strategies, attitudes, verbal information and motor skills. With this theory we solve the problem in the form of fractional learning will be seen from the intellectual skills. Train verbal information and also the motorics.

Regarding fractions according [11] says that fractions can be interpreted as part of something intact. The unity broken into smaller pieces produces fractions at the beginning of the matter about this fraction, the students are more directed to recognize the concept of simple fractions, such as knowing the whole concept and that of some and simple fractional values that are often found in the body.

2. Methods

This type of research is a classroom action research by using the learning model of Gagne and the media of human figure line in the fractional mathematics learning. The line of human numbers as the main target of the learning media. This research attempts to describe the use of Gagne learning model as an effort to improve mathematics learning outcomes in VII MTSN 2 Medan . the subject of the research in this classroom action research is the seventh grade students of 32 students. The object of this research is the action to improve student learning outcomes in the learning of the mathematics of the fractional forms with the learning model of Gagne and the human figure line media.

To determine the level of difficulty question used formula :

$$I = \frac{B}{N}$$

information :

I = Index of difficulty for each item

B = the number of students who answered correctly for each item

N = the number of students who answered the intended question.

Classification of problem level :

0.00 – 0.30 the task is quite difficult

0.31 – 0.70 the task is moderate

0.71 – 1.00 the task is quite easy

Seen from the above percent with a value of 72 %that the problem is quite easy.

Observation result

Test results

After conducting trials in class VII with the group was the result of their training is quite good, with the test 4 questions are:

Write your date of birth according to the group, use as a regular fraction!

The date of birth makes the decimal fraction!

Write down the line numbers using the usual fractions (birth date) in order from the smallest to the largest!

Turn the decimall fraction into a fraction a. 0.5 b. 5.20 c.10.500, d.4.32

Question quality is:

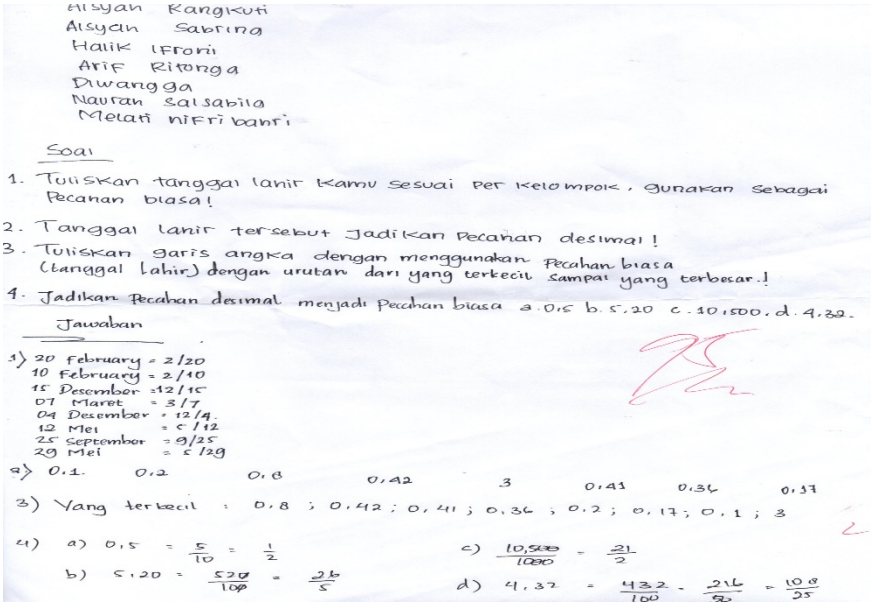
Very Good IP = 76% - 125%

Good IP = 51% - 75% or 126% - 150%

Poor IP = 26% - 50% or 151% - 175%

Ugly IP = 0% - 25% or176% - 200%

Very Ugly IP = more than 200%


Alsyan Kangkuti
Alsyah Sabrina
Halik Iffori
Arif Ritonga
Diwangga
Nauran Salsabila
Melati Nifribanti

Soal

1. Tuliskan tanggal lahir kamu sesuai per kelompok, gunakan sebagai Pecahan biasa!
2. Tanggal lahir tersebut Jadikan Pecahan desimal!
3. Tuliskan garis angka dengan menggunakan Pecahan biasa (tanggal lahir) dengan urutan dari yang terkecil sampai yang terbesar.!
4. Jadikan Pecahan desimal menjadi Pecahan biasa a. 0,5 b. 5,20 c. 10,500. d. 4,32.

Jawaban

1) 20 February = 2/20
10 February = 2/10
15 Desember = 12/15
07 Maret = 3/7
04 Desember = 12/4
12 Mei = 5/12
25 September = 9/25
29 Mei = 5/29

2) 0,1. 0,2 0,8 0,42 3 0,41 0,36 0,17

3) Yang terkecil : 0,8 ; 0,42 ; 0,41 ; 0,36 ; 0,2 ; 0,17 ; 0,1 ; 3

4) a) $0,5 = \frac{5}{10} = \frac{1}{2}$
b) $5,20 = \frac{520}{100} = \frac{26}{5}$
c) $\frac{10,500}{1000} = \frac{21}{2}$
d) $4,32 = \frac{432}{100} - \frac{216}{50} = \frac{108}{25}$

Figure 3: hasil pekerjaan siswa

Student data and student score results obtained

$$x = \frac{\text{number of group values x100}}{\text{amount per group}}$$

$$= 345 \text{ x } 100\% / 4$$

$$x = 86{,}25\ \%$$

3. Result of reserch and Discussion

On the initial condition of the pre test score of student learning outcomes of 24 students, is complete 28 students with 75% presentation. In the second cycle students begin to apply the model of learning Gagne and human lines of human outcomes from the results of cooperative results obtained 86.25 % answer questions. Seen from the results of cycles I and cycles II showed increased learning results in accordance with the theory of Gagne due to stimulation and stimulus for children who motivation or encouragement from teachers. And from the percentage of questions with 72 percent of the value that is so easy. So the conclusion of MTSN 2 VII students are:

1. MTSN 2 grade VII students are still quite good answer the question
2. The problem is moderate (easy to understand), although there is still a low
3. No matter, no. 1 is easier than question number 3 and number 2 and number 4 is difficult because

ordinary frctions make decimal fractions or decimal fractions into ordinary fractions here some students are not good at dividing

4. Based on the data of the research results of 32 students class VII there are 4 groups, each group consists of 8 students who expressed complete with the value of 72%

It is in accordance with Gagne's theory of learning that it is believed that every child has different cognitive abilities, that learning is a process of changing the behavior of an organism as a result of experience, and learning to solve problems, the rules obtained are used to solve problems . For Gagne learning can not be easily defined because learning is complex. In the statements stated that the results of learning will resukts in changes in someone in the form of a change of ability, attitude chnge, change of interest or value in a person. The change is permanent although only temporary. From seeing the characteristics of students in the classroom have a stimulus from within to solve problems as experience. The learning of fractional mathematics using the Gagne learning model and the human figure line media is very interesting for students so it does not consider mathematics difficult.

According to the Brunner as follows: the firs less dependent response of the nature of the stimulus. Here the child learns to change the response in his stimulus environment and control it to gain the freedom of changing the stimulus before the response. Second, the process of how one internalize events into a storage system. So the opposite of Gagne's theory of students is influenced by stimuli [10]. While the theory of learning anusubel is meaningful, meaningful learning is a process linked new information on relevant concepts contained in a person's cognitive structure. Concrete and appropriate media in fractional learning. The purpose of the study was to describe the use, barriers, and solutions of human birth date media in enhancing the understanding of ordinary fractions. This fraction lesson is a bit difficult so teachers should be good at minimizing the difficulty felt by each student so that it takes a learning strategy, so that the learning process of mathematics will be handled well and the child feel calm facing the math lesson. Mathematics learning strategy here using the human birth date media itself as a fractional material. The mathematics learning model is the conceptual framework of mathematics learning. The mathematics learning is the learners of mathematics and lecturer to transform the knowledge of mathematics and facilitate the activity of learning mathematics can include learning strategy approach, method and technique of learning. Gagne learning model in which the results of elarning is influenced by five skills, namely intellectual skills, cognitive strategies, attitudes, verbal information and motor skills. Based on the above opinion, it can be concluded that the learning of fractional mathematical learning with Gagne learning model and human numerical line is an interesting and non-boring learning model in learning mathematics. Appearances that can be observed as a result of learning called the ability of students. Learning refers to various teaching models, can be done. Working individually and can be a group of cooperation mastering the subject matter.

5. Conclusion

Mathematical learning strategy of fractional form by using learning model of Gagne and human figure line media can be used to improving learning outcome of students'.

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